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THE

NATIONAL GEOGRAPHIC MAGAZINE

PROCEEDINGS

OF THE

INTERNATIONAL GEOGRAPHIC CONFERENCE

AT

CHICAGO

[illegible]

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THE NATIONAL GEOGRAPHIC MAGAZINE

PROCEEDINGS OF THE INTERNATIONAL GEOGRAPHIC CONFERENCE IN CHICAGO

JULY 27-28, 1893

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INTRODUCTION.

Inasmuch as the World's Columbian Exposition, held at Chicago, Illinois, from May 1 to October 30, 1893, was in commemoration of the greatest geographic discovery of recorded history, the NATIONAL GEOGRAPHIC SOCIETY felt that in some manner American geographers should participate therein. Since space and means were lacking for the installation and maintenance in the Columbian Exposition of a geographic exhibit strikingly illustrating the evolution of geographic discovery and exploration in the American hemisphere, it became necessary to devise other means of celebrating the discovery of our hemisphere by Columbus.

For those reasons the President and Board of Managers of this Society took into consideration the advisability of participating in the series of remarkable congresses which were to be held at Chicago during the period of the Exposition. It was thought that a separate congress of geography was inadvisable and that a meeting to be designated a "Conference of American and European geographers," should form a section of the World's Congress of Education. This decision was formally approved by the Society, and action in accordance therewith was promptly initiated.

The Board of Managers decided that this conference should be held under the auspices of the NATIONAL GEOGRAPHIC SOCIETY, and with this view appointed the following committee with full powers in the premises: The Honorable Gardiner G. Hubbard, General A. W. Greely, Dr T. C. Mendenhall, Professor W. B. Powell, and Professor T. C. Chamberlin.

The United States Commissioner of Education, the Honorable William T. Harris, President of the World's Congress of Education, cordially approved of the plans of the committee and offered all possible facilities for their satisfactory completion. The preliminary notices were incorporated in the program of the World's Congress of Education. The Hall of Washington, Art Institute Building, was assigned as a place of meeting, and two days, Thursday and Friday, July 27 and 28, 1893, were set apart for a "Conference of American and European geographers" by authority of the Congress of Education.

Formal invitations, in the name of the NATIONAL GEOGRAPHIC SOCIETY, were extended to the principal geographic societies of the world to participate in the Conference by delegates, or by the presentation of memoirs, and many favorable replies were received. The Conference met on the designated day; its proceedings were marked by a degree of interest and an attendance quite beyond the expectations of the committee, and it is believed that it exercised a material and beneficial influence toward the study of geography in the United States.

With a view of affording variety to the meetings, and also of utilizing, in the interests of the Conference, the numerous objects of geographic interest in the Columbian Exposition, it was decided that the sessions of July 27 should be held in the Art Institute Building, Chicago, and those of July 28 within the Exposition grounds.

As this Conference was the first international meeting of geographers in America, the Board of Managers of the NATIONAL GEOGRAPHIC SOCIETY deem it proper to publish, under the auspices of the Society, the record of this Conference, together with such of the memoirs as it has been found practicable to incorporate therewith.

Among the countries and societies which showed their lively interest in the Conference by designating delegates are the following:

BRAZIL.

Instituto Historico Geographico y Ethnographico (Rio de Janeiro); delegate, Baron de Marajo.

FRANCE.

Société de Géographie (Paris); delegate, M. E. Levasseur, Membre de l'Institut.

Société de Géographie de Lille; delegate, M. Paul le Blanc.

ENGLAND.

Royal Geographical Society; delegate, Colonel Sir Clinton R. Markham, K. C. M. G.

Manchester Geographical Society; delegate, Mr. James D. Wilde, Member of the Council.

MEXICO.

Sociedad Mexicana de Geografía y Estadística; delegate, Señor Dr D. Ignacio N. Navarro, Consul-General of Mexico at New York.

PORTUGAL.

La Sociedade de Geographia de Lisboa; delegate, Mme Regina Mattey.

SCOTLAND.

Royal Scottish Geographical Society; delegates, Dr George Smith, C. I. E., LL.D., Member of the Council, and the Honorable John Abercrombie.

UNITED STATES.

American Geographical Society (New York); delegate, Professor William Libbey, Junior.

The Geographical Society of the Pacific (San Francisco); delegate, Professor George Davidson, of the United States Coast and Geodetic Survey, President of the Society.

The National Geographic Society was represented by the Honorable Gardiner G. Hubbard, President, and General A. W. Greely, U. S. Army, Vice-President, as delegates; Miss E. R. Scidmore and Mr F. H. Newell, Secretaries; Professor William B. Powell, of the Board of Managers; Major J. W. Powell, Director United States Geological Survey; Colonel F. W. Parker, and others.

MINUTES OF THE CONFERENCE

F. H. NEWELL AND ELIZA R. SCIDMORE, Secretaries

The sessions were opened in the hall of Washington, Art Institute building, Chicago, at 10 o'clock a. m. July 27, 1893. There were present about four hundred individuals, including delegates and invited guests.

The Honorable Gardiner G. Hubbard, President of the NATIONAL GEOGRAPHIC SOCIETY, was called to the chair as presiding officer of the Conference, and Mr F. H. Newell was appointed Recording Secretary.

Several communications from societies and individuals were laid before the Conference.

The Royal Geographical Society, through its Secretary, Mr J. Scott Keltie, expressed its sincere regret that it could not be represented by a member of its Council in addition to the regular delegate, Sir Clements Markham.

The Royal Scottish Geographical Society, through its Secretary Colonel Fred. Bailey, offered its congratulations to the Conference and expressed its cordial good wishes for the success of so important an assemblage.

Dato Sri Amar d'Rajah, of the Johore Commission, regretted that his unexpected departure for Europe prevented him from reading a paper on Johore. On the part of the Johore Commission he expressed the hope to be able shortly to present the first complete map of Johore ever published.

Baron de Maruja, delegate of the Instituto Historico Geografico y Ethnografico do Rio de Janeiro, expressed the very lively interest of himself and the society he represented in the Conference, and presented nine volumes of geographic researches, etc, published by his society. While he could not then speak on the geography of Brazil, he promised a memoir thereon for future publication.

Señor Graciano A. de Saavedra, Commissioner from Brazil, congratulated the Conference on its meeting, and promised for publication a paper on the development of southern Brazil.

M. E. Levasseur, Membre de l'Institut, delegate from the Société de Géographie of Paris, wrote from New York that im-

paired health prevented his attendance, greatly to his regret. His thirty years of geographic study and research inspired him with an intense desire to participate actively in the discussions of this Conference. He had hoped to set forth the importance of economic geography, and enclosed a bibliography of his works.

General John Eaton, formerly United States Commissioner of Education, took the Chair and presented to the Conference the Honorable Gardiner G. Hubbard, who made the opening address, treating of the relations of the currents of air and water to the temperature of countries and to animal and vegetal life.

Honorable John Abercromby, delegate from the Royal Scottish Geographical Society, spoke briefly as follows:

Mr President, Ladies and Gentlemen: Though here to represent the Royal Scottish Geographical Society I had not intended to address the Conference, as I am not a professional geographer, and indeed have only been actively associated with the work of the Society for less than a year; I come rather to pick up information than to impart it, rather in the capacity of an absorbent sponge than as an overcharged rain-cloud. Such being the case, I confine myself to giving a brief summary of the origin and work of my own Society.

The Royal Scottish Geographical Society was formed some nine or ten years ago with the laudable object of educating the Scottish public in the subject of geography and of keeping them thoroughly informed of the progress made in the subject in all parts of the world through the medium of a monthly magazine, which I am glad to say has also a certain circulation in the United States. Some of the earlier numbers contain valuable papers on the various methods employed by map-makers to overcome the inherent difficulty of transferring geographic points on an irregular globular surface like the earth to a flat surface like that of a map. Other technical matters have also been treated of at various times, so that the magazine has a real educational value apart from the papers descriptive of travel, adventure and the strange habits and customs of savage peoples. Our late secretary, Mr A. Silva White, contributed more than one monograph on the geography and history of that part of eastern Africa in which Great Britain and Germany are more nearly interested, and they will always possess a permanent value.

In order to popularize the subject as much as possible, papers are read monthly before the members of the Society and their friends for nine months every year. Most of the explorers who have read papers before the Royal Geographical Society of London are willing to speak before us in Edinburgh as well as at our branch societies at Glasgow and Aberdeen. The first speaker to address our new-born Society was Mr Stanley after his return from one of his earlier travels of exploration in the great African continent; and the session this year was expected to close by an address from Lieutenant Peary, on his projected expedition in the direction of the North Pole. Unfortunately a letter arrived from him shortly before I left home expressing regret that owing to unforeseen circumstances he was obliged to abandon his scheme of coming to lecture in Great Britain before the departure of his expedition.

I ought not to omit to mention that though we are a private society and receive no aid from the government, our library and the privilege of consulting maps, books and consular reports is freely opened to the public. Considerable use is made of these facilities by persons engaged in commerce, and almost daily our librarian is consulted by those who are not members of the Society, but are desirous of obtaining commercial information in regard to foreign countries. In this way the Society distinctly benefits the public. Another way in which the public may receive instruction free of cost is by courses of lectures on physical geography or geology in relation to geography, on the distribution of plants and animals over the globe, and other kindred subjects. These lectures are given either by a member of the Society or by some other competent person, and are generally well attended, especially by the young and by the fair sex.

The most important work on which a committee of my Society is now engaged is a thorough and complete revision of the spelling of the Gaelic and Norse names in northern Scotland, in conjunction with the director of the Ordnance Survey of the United Kingdom. On existing maps the Gaelic names are not always given correctly; the spelling is irregular, and when given correctly cannot be pronounced properly by a person ignorant of Gaelic and its remarkable spelling. For instance, in the island of Skye the Cuillin hills are spelt on the ordnance maps Coolinlin, as if they were called after the old Irish hero of that name, though they have never received that designation from the people

of Skye. The committee is proceeding in this manner: Every local name on the map is submitted to three or four of the oldest men in the parish, and their pronunciation is taken down by a person speaking Gaelic. In this way the local pronunciation is surely fixed, and if the words have a significant meaning they can easily be written in standard literary Gaelic if that should differ from the local pronunciation. As I am not on the committee myself, I am not certain whether the words are to be given phonetically on the map or according to literary usage in Gaelic; but I have no doubt that they ought to be rendered phonetically, so that even those unversed in Gaelic would be able to read them correctly. Old Irish was written as it was pronounced, but unfortunately the fadhists of the sixteenth century—for there were fadhists even in those days—invented an absurd rule, opposed to every philological principle, and still in force, which they called in Irish or Gaelic, "*caol ri caol, leathan ri leathan*;" that is to say, if there is a slender vowel, as *e* or an *i*, in the first syllable, then the first vowel of the next syllable must be slender. Similarly, if the vowel of the first syllable is broad, as *a*, *o*, *u*, the first vowel of the second syllable must also be broad. These extraneous, inorganic vowels do not affect the pronunciation, and in a reformed spelling ought certainly to be omitted. Another fruitful source of inaccuracy in writing Gaelic words arose from spelling in accordance with a fanciful and in reality a baseless etymology. The dictionary of the Highland Society and O'Brien's Irish Dictionary are full of examples of this sort, though there is this excuse for them, that both were compiled before philology became an exact science and before old Irish of the ninth and tenth centuries was known to the learned world. The task which the committee has to accomplish is therefore by no means an easy one.

Another subject which the Royal Scottish Geographical Society has had under consideration, though no action has yet been taken, is one that relates to lake basins. On all our ordnance maps the configuration of the earth's surface always ceases with the surface of the water; no soundings are given, no under-water contours, and all knowledge of the bottom of the lakes is left to the imagination. Such a state of things is clearly inexcusable, but unfortunately the funds of the society are insufficient for the task. The Admiralty, which considers fresh-water lakes beyond its province and draws the line at salt water,

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a death. If we suppose this area to have been flooded by warm water in the manner [illegible] suggested above, it is easy to see that when this warm band receded the cold bands of its continuity would occur in that extreme part of the band along the coast between Cape May and Nantucket. The slowness of this process of the return of cold water would, as contrasted with the sudden inflow of the warm water, [illegible] of water of sufficient degree of coldness to [illegible] them and start them on their way to the surface. After they had found a [illegible] in the water which [illegible] to [illegible] of water pressure, they were bound to go the rest of the way to the top, where they arrived in a [illegible] condition, as their [illegible] were [illegible] the top, [illegible] most instances [illegible] from [illegible] as a result of the [illegible] of pressure.

The results of [illegible] are [illegible] to lead to interesting results. It is to be hoped that Congress will some day see the connection between pure and applied scientific work clearly enough to enable them to supply the means for the carrying out of investigations which are not of practical bearing, and that the scientific investigations of the Government will not be forced to suffer through the lack of intelligent support which should be given them.

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little less than 1½ per cent. of the total. Deducting the aggregate acreage of desert and wooded lands, there are left about [illegible] acres, the greater part of which supports a scanty herbage which, either directly or indirectly, is mainly eaten by cattle. This may all be grouped under the head of grazing [illegible] of the western lands [illegible] of dependent sustenance. Most of the smaller area of land, comprising over two-thirds of the area west of the 100th meridian, has a fertile soil and climate favorable to agriculture in all respects save lack of moisture. With water, great crops could be produced, but without it nothing but a scanty native growth appears. The area which has actually been reclaimed by irrigation is, as shown, not to exceed 1 per cent. The eleventh census of the United States found that in 1889 only 3,631,381 acres were irrigated, this being but considerably less than 1 per cent of the entire area west of the 100th meridian. Besides the area irrigated, a relatively small area was cultivated by "dry" farming, the yield being, however, small.

The further extension of agriculture within the arid region rests on the complete utilization of the water supply. As previously stated, the streams have been employed to a large extent and there now remain only a few rivers from which water for irrigation can be had.† These flow unrestrained because of the great expense and the magnitude of difficulties encountered, rendering doubtful the financial success of any undertaking. In the case of many of the smaller streams the aggregate of the claims to the water exceeds by far the ordinary quantity discharged, and as a result, most of the older canals must be satisfied with a quantity of water less than that to which they are entitled.* At the same time a large proportion of the water of these streams flows to waste in [illegible] of winter, all of which could be used to great advantage if it could be held in storage.‡ The construction of storage reservoirs for the winter waters [illegible] appears at present to have to await [illegible] private capital from entering upon such projects.

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* Eleventh Census of the United States, 1890. Irrigation in Western United States, by F. H. Newell, p. [illegible]

† Water Supply for Irrigation, by F. H. Newell, in Thirteenth annual report of the United States Geological Survey.

‡ Hydrography of the Arid Regions, by F. H. Newell, in twelfth annual report of the United States Geological Survey, pt. II, [illegible]

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RECENT EXPLORATIONS IN ALASKA

BY

ELIZA RUHAMAH SCIDMORE

When the United States purchased Russian America by the treaty of June 20, 1867, it came into possession of a vast empire, whose shores were but very imperfectly surveyed, whose interior was unexplored and unknown, and of whose resources almost nothing was known. It had been maintained only as a preserve by a Russian company holding lease of the entire country. They made no effort to explore the interior, satisfied that the natives should bring their pelts down to the coast forts. They had traced only our largest river for a few hundred miles, and the Hudson Bay Company's men had discovered its head waters and found out that the Yukon and the Russian Kwichpak were the same. The Coast range and its great peaks were only known as navigators of the Pacific had seen them, and of the interior only the surveys of the Western Union Telegraph Company in 1865-'66 had given any account.

There was considerable interest in the new territory at the time of its purchase, and Secretary Seward immediately arranged for a scientific reconnaissance in the summer of 1867 under the charge of Professor George Davidson of the United States Coast and Geodetic Survey. His observations covered the coast country from Dixon Entrance to Unalaska, and so much of interest resulted that the American Geographical Society of New York petitioned Congress to have an exploring expedition of the newly acquired territory.

A quarter of a century has elapsed without the general government yet undertaking any systematic scheme of survey or exploration. There are no official maps of the mining regions which have been adding $[illegible] to the wealth of the world each year. Only the mineral laws and not the general land laws apply to the territory, which has no adequate form of government and no voice or representative in Washington.

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[illegible] the plan came to nothing. On August 8, 1511 these three dioceses were suppressed and three others were erected instead at Santo Domingo and Concepcion de la Vega, in Hispaniola, and at San Juan, in Porto Rico, and placed under the jurisdiction of the archbishops of Seville, where the government of the colonies [illegible].

In August and September 1513 (see the letters of that date), John of Quevedo, a Franciscan friar, was appointed to the see of Santa Maria del Antigua, or Darien, and [illegible] commended to the [illegible] and people. He was the first bishop of a diocese on the American continent. He [illegible] December 5, 15[illegible].

[illegible] Already several bands of priests both secular and regular were working for the [illegible] of these countries and to convert the natives. The popes, however, as [illegible] wished to increase the number of these ministers and to provide for their government. A letter of Clement VII, dated June [illegible], 15[illegible] [illegible] the [illegible] urges the general of the Franciscans to visit personally the [illegible] new world. [illegible]

[illegible] two hundred and twenty Franciscans, [illegible] and to them [illegible] to the lately converted [illegible] will [illegible] their respective [illegible] privileges and exemptions [illegible] kings of Spain and Portugal [illegible] of the [illegible] discovered, or to be discovered, territories.

Pope Julius II Recommends Bartolomeo and Diego Columbus to the King of Spain

On the death of Christopher Columbus, May 20, 1506, [illegible] the [illegible] family [illegible] known as the Adelantado. With a [illegible] Bartholomew and Diego, the son of the discoverer, determined to join King Ferdinand, then at Naples, passing through Rome on their way thither they were kindly received by Pope Julius II, and obtained from him a recommendation to Ferdinand, who seems already to have been [illegible] disposed towards them.

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in like manner to [illegible] from the [illegible] of the city and [illegible] the church of S. Maria del Antigua [illegible].

Today, a bishop, by our [illegible] in the fulness of our apostolic authority, we provide for the church of S. Maria del Antigua, in the island of [illegible], which has been vacant since its first erection, in the person of our beloved [illegible] elect of S. Maria del Antigua, [illegible] to our [illegible] for [illegible] of the [illegible] to him the care and administration in spiritual and temporal matters, according as in our [illegible] fully expressed [illegible] written to that effect. Wherefore we earnestly ask and exhort you all, we order [illegible] by apostolic [illegible] to [illegible] receive [illegible] as your father [illegible] and your [illegible] grateful [illegible] reverence [illegible] honor [illegible] that you [illegible] commendable [illegible] and that you [illegible] to have found [illegible] benevolent father.

Given as above.

To the same [illegible] beloved daughter in Christ, Joanna, [illegible] illustrious Queen of Castile and Leon, health [illegible] etc.

Since then, beloved daughter [illegible] it is a [illegible] work [illegible] to act with benign favor towards the [illegible] of God and to [illegible] the [illegible] for the glory of the eternal king, we earnestly request [illegible] exhort [illegible] reverence [illegible] the apostolic see, to [illegible] the same elect [illegible] and the church of S. Maria del Antigua [illegible] commended [illegible] etc.

Given as above.

4

Letters from Pope Leo [illegible] dispensation for the [illegible] of [illegible] of Quevedo as bishop of Darien.

Translation.

M [illegible] XX XIX [illegible]

Leo X, to our beloved son, [illegible] elect of S. Maria del Antigua, health [illegible] etc.

Since we by apostolic authority [illegible] counselled by our brethren, have thought it proper to provide for the church of S. Maria de

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible] Fundamentals

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

19. [illegible] of the [illegible] Cabrillo and Ferrelo.

The general [illegible] of the [illegible] may be first briefly stated by [illegible] the more [illegible] and [illegible] by following the [illegible] less [illegible].

The vessels sailed in company from cape San Lucas, in latitude 22° 52', July [illegible], 154[illegible], reached Magdalena bay, in latitude 24° 32', July 13, [illegible] in latitude [illegible], July 19, [illegible] San Bartolomé, in latitude 27° 39', August 1, Cerros island, in latitude 28° 02', August 5, [illegible], in latitude 29° 25', August 15, port San Quentin, in latitude 30° 24', where they took possession of the country, August 2[illegible], point Santo Tomas, in latitude 31° 33', September 8, San Diego bay, in latitude 32° 41', September 28, Santa Catalina island, in latitude [illegible], October 7, and San Buenaventura, at the [illegible] entrance to the Santa Barbara channel, in latitude 34° 17', October 10.

During these three months their progress has been very slow because the prevailing summer wind was directly ahead, and [illegible] a long and weary task to work their clumsy vessels to windward. With the modern vessels of the [illegible] the same [illegible] have been made in [illegible] months. The weather was favorable: no storms of wind and rain, but generally clear skies with fogs at night [illegible]. [illegible] the Santa Barbara channel [illegible] the pleasantest part of the year after the [illegible] season, [illegible] the country apparently [illegible]. They had no difficulties with the natives, and we may well suppose that they looked forward with hope and confidence to the [illegible] and [illegible] of their [illegible] of [illegible]. At San Buenaventura they established very friendly relations with the [illegible] villages of that vicinity, with [illegible] coming through the [illegible] to the west and the Santa Clara coming through the broad flat valley to the eastward. They [illegible] from the natives and perhaps had [illegible].

In their progress through the Santa Barbara channel, they must have [illegible] by [illegible] of the natives, for [illegible]. "[illegible] Wednesday, [illegible] they arrived at a large [illegible] which [illegible] and

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] outside of the general trend of the coast line the great gulf under the present gulf of the Farallones, which is understood to comprehend the area between point Reyes, the group of the Farallones and point San Pedro, including the Golden Gate to San Francisco bay, and the anchorage of Drakes bay under the southern extremity of point Reyes head.

It is very interesting to note what Ferrelo states about this gulf. [illegible] it was [illegible] to be [illegible] and the discolored water thereon [illegible] the presence of a great river. [illegible] they were [illegible] the land [illegible] that no landing could be made on account of the large swell, and as they lay particular stress upon the [illegible], I judge they were looking in the northern part of the gulf to secure an anchorage under the north shore, but failed.

These discolored waters were brought down by floods from the Sacramento and San Joaquin rivers. They are known to all our vessels and are particularly marked after great rains. [illegible] the summit of point Reyes I have [illegible] and the [illegible] carried by the [illegible] current far to the northward of point Reyes, and [illegible] extend well outside of the Farallones. With [illegible] conditions of weather such persistent efforts for exploration would [illegible] with the discovery of Drakes bay and doubtless the Golden Gate.

When they had decided that further search was useless they anchored and took possession of the country through the [illegible] of [illegible]. With the depth of forty-five fathoms the vessel must have been either six or seven [illegible] from the southeast Farallon outside the line [illegible] to point Reyes, or more likely five [illegible] southwestward from the southeast Farallon, and [illegible] latitude [illegible]. [illegible] of [illegible] the [illegible] of [illegible] difference [illegible] they [illegible] toward the shores [illegible] the bar of the Golden Gate. In the [illegible] seaward from the [illegible] latitude [illegible] 37° 40′.

It is a rather curious fact that neither [illegible] refers to the two groups of the Farallones, close to which they must have anchored. The northwest group [illegible] with [illegible] of [illegible] a quarter of a mile, and [illegible] five or six [illegible] rocky [illegible], of which the highest is 155 feet. The southeast Farallon has an area of [illegible] by [illegible]

quarters of a mile, is very irregular in outline, and broken into four or five bold granite peaks, of which the highest is [illegible] [illegible] shown on [illegible] and is visible from a ship's deck at about twenty

[illegible] [illegible] [illegible] on the eastern point of Point Reyes head, in the northwestern part of the gulf of the Farallones [illegible] [illegible] the [illegible] southeast [illegible] vessel [illegible] a large supply of fresh seal meat. [illegible] [illegible] the Farallones [illegible] this published narrative [illegible] they are laid down on the [illegible]

The great sierra which the Cabrillo vessels had encountered and [illegible] the mountains of the peninsula of San Francisco with snow, and Ferrelo [illegible] along the coast into the great gulf southward says: "All the coast they passed by this day is very bold, and there is a great swell of the sea, and the land is very lofty; there are mountains which reach to the sky, and the sea beats upon them. When sailing near the land it appears as if they would fall upon the ships; they are covered with snow to their summits. They gave them the name of las Sierras Nevadas, and the principal one of them is a cape which projects into the sea, which they named Cabo de Nieve. The coast runs north-northwest and south-southeast. It does not appear that any one has inhabited the coast. The Cabo de Nieve is in thirty-eight degrees and two-thirds, and always when the wind blew from the northwest, the weather was fair and clear."

Cabrillo says "they were seeking for a port," and hence the [illegible] of the foregoing narration.

Their snowy cape [illegible] [illegible] 38° [illegible] [illegible] [illegible] taken [illegible]. The [illegible] of the navigators [illegible] somewhat exaggerated [illegible] [illegible] they [illegible] [illegible] acquainted with the [illegible] of the [illegible] of the peninsula [illegible] the [illegible] [illegible] satisfactory to those who have [illegible] [illegible] storms [illegible] the [illegible] range of mountains [illegible] [illegible] [illegible]

[illegible] [illegible] January 1854, the cold [illegible] severe, reaching 17° [illegible], the force of the wind terrific, and the depth of the snow two or three feet.

The Cabo de Nieve, or snowy cape, [illegible] [illegible] of the high mountains on this part of the coast north of San Francisco and rises abruptly [illegible] [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

ru[illegible], with [illegible] water off the [illegible] west[illegible] of San Miguel island, two and a quarter miles westwardly from the entrance to [illegible] harbor or port Possession. The Coast Pilot gives particular warnings about these dangers. [illegible] and prudence [illegible] northwest weather.

Ferrelo [illegible] the north[illegible] [illegible] with only two [illegible] the other ship disappeared, so that they suspected that the sea had swallowed it, [illegible] they could not discover it any more, even after [illegible] look. They [illegible] they must have been in forty-four degrees when the last storm [illegible] them [illegible] compelled [illegible] to run to leeward."

[illegible] says that on account of the [illegible] storm "they were forced to go to the Isla de la Posesion (San Miguel island), where they arrived on the [illegible], [illegible] on account of the heavy breaking at the mouth of the harbor [illegible] under the Isla de San Sebastian, [illegible] to the south-southeast; and at [illegible] night [illegible]

After the vessels met at Cerros island Ferrelo says: "That ship passed the Isla de Juan Rodriguez at night, passing through some breakers, so that they thought they must be lost, and the [illegible] to go into port [illegible] had [illegible] them."

This is the first time [illegible] the island of San Sebastian. As the *Victoria* was off Cuyler's [illegible] at night, [illegible] after the *Capitana* had passed it, [illegible] the heavy northwester [illegible], he was very naturally unable to [illegible] the anchorage of port Possession, and probably steered through the San Miguel passage and found [illegible]. [illegible] of Santa Rosa island, between [illegible] Point [illegible] Punta de San Sebastian, now known as [illegible] [illegible] anchorage [illegible] where the [illegible] vessel [illegible] few days in [illegible] Santa Rosa island [illegible] San Buenaventura [illegible] San Quentin, and [illegible] islands [illegible] on the 24th of March, [illegible] on the 26th [illegible] arrived. When [illegible] the *Victoria* [illegible]

crew made these demands that they should return to New Spain, as we had nothing that we could eat; and because this was in reason, they ordered the return, something for their comfort." (Cabrillo's narrator.)

Some question has arisen about the probability of those small, badly equipped vessels, with mixed crews of Spaniards and Indians, broken down by scurvy, making such good time. It seems quite reasonable that they reached the latitude observed, and that they commenced to scud before the northwester from latitude 42° 30′ to a position off Fort Ross, making about 275 miles between the morning of March 1 and the evening of March 3, or about five miles per hour. From the last position to San Miguel island the Cipriano sailed not less than 315 miles in about thirty-eight hours, or more than eight miles per hour, with an evident increase in the force of the wind. Cabrillo's narrator says that "in five days they ran 200 leagues with reefed foresail," and his vessel reached San Miguel island on the same day as the *San Salvador*, but later. It was a run for life, and these masterful navigators must have handled their craft with consummate skill and decision. I have no doubt whatever of their statements.

Concluding Remarks.

This is a condensed review of this heroic voyage or voyages of discovery and exploration in the very heart of our winter gales. The whole story is ingenuously told; there is no complaint of sickness or of the insubordinate of the crews. To the contrary the narrative is full of pathos.

I have endeavored to point out only a few of the identifications of the two principal actors; I have not quoted from Ulloa, Drake or Vizcaino. To exhibit the details of the narratives of those five remarkable men, I drew up, in 1882, their statements in parallel columns following the localities from the south toward the north, preserving the entire narratives of Cabrillo and Ferrelo, and using such parts of the others as related to the positions of the former or to new localities intermediate. I then appealed to my personal knowledge of the localities, and to my descriptions from the manuscript for the Coast Pilot of 1880, and to the Coast Pilot of Lower California. During the investigation doubtful cases of identification were left in abeyance until well authenticated locations to the north and to the south were fixed; then the doubtful cases were har-

mentioned without straining. Many minor and interesting statements noted in the narratives have been verified, such as the seventeen villages which Ferrelo names from the Gaviota anchorage to point Concepcion. On the Coast Survey chart there are seventeen streams, where we found the remains of old settlements as we traveled this part of the coast in 1850.

It is proper to mention that upon the return of the vessels to the Santa Barbara islands in March, on their final retreat, the confusion of new names to the islands was added; but fortunately I had learned from my colleagues, who had made the detailed surveys of those islands, the advantages and disadvantages of the anchoring grounds around Santa Cruz and Santa Rosa islands under different conditions of summer blows and winter storms, and I am satisfied that the last anchorages of these navigators have been identified.

Of the identification of Drake's anchorages on the coast of California and Oregon I have not spoken, because I propose to elsewhere present a separate paper upon the former; nor have I referred specially to the accurate work of Vizcaino, but I may mention that, upon the authority of his narrative, it has been long asserted that a great forest covered the Loma that lies between San Diego bay and False bay to the northward. This erroneous statement has arisen from the mistranslation of "el monte," which in the narrative signifies hill; that is the point Loma of the modern charts.

Such instances as these have satisfied me that all the narrators made truthful records, so far as they wrote, and this conviction has enabled me to clearly explain in my monograph several apparent inconsistencies in parts of Vizcaino's narrative.

The mass of details presented in the monograph cannot be given in this short paper, but I presented in the Report of the United States Coast and Geodetic Survey, 1886, appendix No. 7, a tabulation of the results, which establish the identification of the seventy-one landfalls, capes, points, bays, anchorages and islands mentioned by Cabrillo and Ferrelo. I also appended a chart to exhibit in graphic and still more condensed form these identifications.

It will be noted that in this list and chart there is no mention of the groups of the Farallones off the entrance to San Francisco bay, although Cabrillo and Ferrelo must have seen them. Drake mentions and names them; Vizcaino has them on his chart, but does not mention them in his narrative.